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# PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): Zipfel 1

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on 10/27/2008

Signature: /Ronald D. Slusky/

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| Application Number | Filed |
|---|---|
| 10/783,499 | 02/20/2004 |

First Named Inventor: ZIPFEL, George Gustave, JR.

| Art Unit | Examiner |
|---|---|
| 2815 | SHINGLETON, Michael |

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [x] attorney or agent of record. Registration number 26,585
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

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10/27/2008
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

- [x] *Total of 1 forms are submitted.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**



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|---|---|
| **In re Application of:** | : |
| George G. Zipfel, Jr. et al | **Attorney Docket No:** Zipfel 1 |
| **Serial No.:** 10/783,499 | **:Art Unit:** 2815 |
| **Filed:** 02/20/2004 | **:Examiner:** SHINGLETON, Michael B. |

**Title**: SWITCHING AMPLIFIER FOR DRIVING REACTIVE LOADS

## REASONS FOR REQUEST OF PRE-APPEAL BRIEF REVIEW

### Key to Prosecution Documents Referred to Herein

| | |
|---|---|
| Office action: | Final Office action mailed 04/29/2008 |
| RESPONSE 1; | Applicant's paper dated 06/13/2006 |
| RESPONSE 2: | Applicant's paper dated 09/28/2006 |
| RESPONSE 3: | Applicant's paper dated 11/10/2006 |
| RESPONSE 4: | Applicant's paper dated 12/26/2006 |
| RESPONSE 5: | Applicant's paper dated 07/09/2007 |
| RESPONSE 6: | Applicant's paper dated 12/10/2007 |
| DECLARATION:: | Rule 132 declaration of applicant George Zipfel, Jr. Ph.D. attached to RESPONSE 6 |

### Overview of the Operation of Applicant's Embodiment

The following is the general operation of the switching amplifier of FIG. 4A, taken as exemplary.

(1) Signal PWM (FIG. 3A) is applied across a path including inductor 39, common-mode inductor 41, and load L1, and signal PWM' (FIG. 3B) is applied across a path including inductor 43, common-mode inductor 41, and load L2.

(2) Signals PWM and PWM' have high-frequency switching components whose fundamental frequencies are in phase with one another because PWM and PWM' have the same modulating signal T (FIGS 3A and 3B).

(3) It is desirable in to keep the switching signals components reaching the loads L1 and L2.

(4) Applicant keeps the fundamental switching frequency component from the loads in one way and keeps the other switching frequency components away from the loads in another way.

(5) Specifically, because the fundamental switching frequency components of PWM and PWM' are in phase with one another, they are seen as "common mode" signals by common-mode inductor 41. As a result, common-mode inductor 41 cancels them. On the other hand, the other, higher-order components of PWM and PWM' are kept from the loads by inductors 39 and 43.

(6) Since inductors 39 and 43 are not looked to to remove the fundamental frequency, they have a filter characteristic that filters at the first harmonic and above, i.e. their passband

includes the fundamental. Advantageously, the three components 39, 41 and 43 are less bulky than if inductors 39 and 43 were called upon to also filter out the switching fundamental.

(7) By contrast, the baseband components of PWM and PWM' are of opposite phase because their modulating signals B and B' are out-of-phase. As a result, the baseband components are seen by common-mode inductor to be differential mode signals. As a result, the baseband components are applied to the loads substantially unattenuated.

**Passband Characteristic of Applicant's Load Filters (e.g., filters 39 and 43)—Claim 63**

Applicant here takes the unusual step of first bringing claim 63 to the panel's attention because applicant has been unable to get a response from the examiner to applicant's arguments about this claim. Claim 63 distinguishes the invention from Prokin (among other reasons) by reciting at lines 7-9 load filters (e.g. 39 and 43 as discussed above) that have particular passband and stopband frequencies. RESPONSE 3, p. 20; RESPONSE 4, p.14; RESPONSE 5, pp. 17-18, RESPONSE 6, p.18. See also the examiner's Interview Summary mailed 01/30/2008 It is respectfully requested that the panel take specific note of this claim.

**General Observations Relative to the Final Office Action's Characterization of Prokin Prior Art**

Claims directed to an apparatus must be distinguished based on structure

The examiner gives no weight to the limitations in various claims on the theory that they do not define structure, such as claim 1, lines 8-14. This is an error.

In claim 1, for example, the recitations in lines 8-14 limit the "generating" function of the recited "means for generating" (lines 4-5) and they limit the "applying" function of the recited "means for applying" lines 6-7. Thus lines 8-14 serve as limitations on the recited means-plus-function elements, which are structural elements defined by their function.

Similar considerations apply to all other claim limitations that the examiner has deemed "functional."

The examiner's reliance on In re Schreiber is misplaced. In that case the difference between the claimed funnel and the disclosed prior art structure was that the claim merely stated an intended use by labeling the funnel as being a popcorn funnel. That is not the case here. Lines 8-14 of claim 1, to take that example, are not statements of intended use but affirmative limitations on the functions of the recited "means for generating" and "means for applying."

Capability of Prokin to function the same as the disclosed invention

The Office action asserts that Prokin is fully capable of functioning the same as the disclosed invention if applicant's signals PWM and PWM' were applied to Prokin. However, the operation of Prokin's circuit requires that the switching components in Prokin be out-of-phase, not in-phase as in applicant's signals PWM and PWM'. So there's no reason for the person of ordinary skill to do what the examiner is suggesting. Moreover, applicant's circuit is not the same as Prokin's (see middle paragraph in the following section). Thus one cannot conclude that the same input signals would result in the same circuit operation.

Examiner's circuit analysis

The examiner concludes that the baseband currents through Prokin's loads sum to substantially zero. This is impossible. If the baseband currents through Prokin's loads sum to substantially zero, then by Kirchoff's Current Law, Prokin's only one source of energy—power supply 1—could not be delivering net energy to Prokin's circuit and, by conservation of energy, no useful work could be done by Prokin's loads. (RESPONSE 1, pp. 14-15; RESPONSE 2, pp. 15, 17)

Among the flaws in the examiner's analysis is to equate Prokin's capacitor 61 with applicant's power supply 31. A capacitor is a passive element and cannot supply net power. Any energy supplied by capacitor 61 must have come from power supply 1, which can't happen if, as the examiner insists, the baseband currents through Prokin's loads sum to substantially zero. Note, too that the two terminals of Prokin's capacitor 61 are connected to the two sides of Prokin's circuit. By contrast both of applicant's power supplies have one terminal connected to both sides of the circuit and the other to ground. It is no wonder, then, the circuits operate differently.

Of course, one cannot rely on unrecited differences; claim 1, for example, does not recite applicant's power supplies. But applicant's point is simply that the two circuits are different, so even if their *inputs* were the same, one cannot conclude that they would *operate* the same.

**Rejection of claims 1, 3-11, 13-17, 19-26 and 30-33 under 35 USC 102**

Sum of instantaneous currents through loads is substantially zero—Claims 1,15

The Office action asserts that Prokin meets the recitation in claims 1, 3-7 and 15 that "the sum of the instantaneous currents through the first and second reactive loads is substantially zero." This is an unwarranted conclusion. The examiner is correct that both applicant's input baseband signals and Prokin's input baseband signals are out-of-phase. However, that doesn't mean that the baseband signals in the two loads are the same because, again, the circuits are not the same. Indeed, applicants have shown in detail why the sum of the baseband currents in Prokin's loads cannot be zero. (RESPONSE 1, pp. 14-15; RESPONSE 3, pp. 16-18; DECLARATION, § I)

The examiner also takes the position that the examiner is entitled to read the term "instantaneous current" to mean some component of the instantaneous current. This is not justifiable. As is well known, the notion of a current's various components is simply an analytical, frequency domain construct. Current means coulombs per second. Period. A component of something is not the same as that something (RESPONSE 3, pp. 20-21).

Same amount of current flowing out of one load flows into the other—Claim 9

This recitation in claim 9, lines 7-13, is an alternative way of stating the above-discussed limitation of claims 1 and 15 and distinguishes for the reasons given above. DECLARATION §II.

In-phase switching band components have the same phase —Claims 26, 33

Claim 26 depends ultimately from claim 9 and it narrows claim 9 by defining the first and second switching signals generated by claim 9's "means for generating" (lines 3-4). Specifically claim 26 states at lines 3-5 that the fundamental frequency components of the first and second switching signals "are of substantially the same amplitude and phase [emphasis added].

Claim 33 has similar limitations at lines 4-5.

By contrast, the corresponding signal components in Prokin are of opposite phase. RESPONSE 1, p. 16; RESPONSE 4, p. 14; DECLARATION, § III.

Switching Band Components Cancel or Are Canceled—Claims 24, 33

Claim 24 recites a "means for applying" the first and second switching signals in such a way that at least certain recited components in those signals are canceled. (This is illustratively accomplished by applicant's common mode inductor as discussed below.)

There is no such cancellation in Prokin. RESPONSE 4, p. 16; DECLARATION § IV.

Claim 33 contains similar recitations. It also explicitly recites the common mode inductor.

*Common Mode Inductor— Claim 33*

Prokin does not have a common mode inductor, as recited in claim 33. However, the examiner takes the position that the recitation of a "common-mode inductor" can nonetheless be read on Prokin's inductors 41 and 42 because that term can be read broadly to mean *any* inductor. The examiner's theory is that "common-mode" when applied to "inductor" is a functional, not a structural, term and is to be given no weight

By his logic, the examiner would equally well come to the unsupportable conclusion that the recitation of a "temperature-compensation circuit" could be read on any circuit whatsoever, such as an amplifier, a modulator, or MPEG encoder, all which are, after all, "circuits."

The fact of the matter is that, a common-mode inductor [or choke] is a specific kind of circuit element. See, as but one of innumerable sources, US patent 5,138,287, stating that a common mode choke is a circuit that blocks passage of the common mode component of an input signal. Indeed, a database search by applicant for "common mode inductor" or the equivalent term "common mode choke" yielded 666 U.S. patents which, applicant will venture to say all refer to the same kind of structural element as disclosed by applicant. Moreover, if "common mode inductor" or "common mode choke" did not mean something specific, electronics suppliers would not be selling parts called exactly that. See, the spec sheet labeled "27" attached to RESPONSE 3. Ass also, e.g., http://www.manufacturers.com.tw/electronics/common-mode-choke.html.

Moreover, whether or not one can call Prokin's inductors 41 and 42 a common mode inductor, those elements do not effectuate the cancellation called from in claim 33.

## Rejection of claims 34–39 41, 42, 63-69 under 35 USC 103

Arguments above also applicable

The following arguments noted above apply to various ones of the claims rejected under 35 USC 103:

- General Observations—All of these claims

- Same amount of current flowing out of one load flows into the other—Claim 63
- Sum of instantaneous currents through loads is substantially zero—Claim 64
- In-phase switching band components have the same phase—Claims 39 and 63
- Switching Band Components Cancel or Are Canceled—Claim 63

Common Mode Filter—Claims 36-39 and 63-68

Prokin does not have a common mode filter. Prokin does not need a common mode filter since Prokin's switching components are out-of-phase (differential mode) signals, not in-phase (common mode) signals. Moreover, Sawashi's disclosure of a common mode filter would not render it obvious to include such a filter in Prokin. In fact, it would be deleterious. RESPONSE 1, p. 16, pp. 18-20; RESPONSE 3, p. 19; RESPONSE 4, p. 14; RESPONSE 5, p. 17; DECLARATION, §§ III, V and VI.

Common-Mode Filter Cancels Fundamental Switching Frequency Components—Claims 36, 39 and 63-68

Even if one used Sawashi's teachings to implement some kind of common mode filtering in Prokin, the resulting combination would not be effective to cancel the fundamental switching frequency components, as is recited in claims 38, 39, and 63-68 because, as noted above, Prokin's switching frequency components are out-of-phase (differential mode) signals.

Passband Characteristic of Applicant's Load Filters (e.g., filters 39 and 43)—Claim 63

Repeating the point made at the outset of these remarks, lines 7 - 9 of claim 63 call for load filters with unique characteristics, specifically, "each load filter having a passband that includes said particular switching frequency and having a stop band at frequencies higher than said particular switching frequency." These are, for example, applicant's filters 39 and 43 of FIG. 4A. No such filters have such a characteristic are shown or suggested in Prokin, nor would there be any reason to do so based on the teachings of the prior art.

Respectfully submitted,

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